

Applicants regard as the invention. Specifically, the Examiner states that the term “high” in Claims 9, 12 and 22 is a relative term which renders the claims indefinite. Applicants have respectively amended Claims 9, 12 and 22 by removing the term “high” and more clearly defining Applicants’ invention. Support for these amendments can be found at page 4, lines 1-14 and page 5, lines 10-22 of the specification.

The Examiner also states that the phrase “the admixing of the shielding material” in Claims 18 and 21 lacks antecedent basis. Claim 18 has been amended to depend from Claim 15 instead of Claim 12, thereby providing antecedent basis for the phrase “the admixing of the shielding material” in Claims 18 and 21.

Claims 10, 14 and 28 are objected to because they include the term “substantially”. Although Applicants believe the rejected claims as originally written are definite, Applicants have respectively amended Claims 10, 14 and 28 to remove the term “substantially”.

Due to the foregoing amendments, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. §112.

Response to Claim Rejections Under 35 U.S.C. §102(b)

Claims 1-29 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,551,976 to *Allen*. The Examiner states that *Allen* discloses a method for the disposal of radioactive waste comprising admixing a polymer with the waste material to encapsulate the waste within the polymer, wherein the polymer prevents radiation from passing through. This rejection is respectfully traversed.

Independent Claims 1 and 22 describe a method for preventing alpha particle radiation from being emitted from radioactive material-containing waste material into an environment. A polymer is admixed with the waste material to encapsulate the radioactive material within the polymer wherein the polymer prevents alpha particle radiation from passing

through the polymer.

In contrast to the claimed invention, *Allen* discloses a method for the disposal of hazardous chemical and/or radioactive waste by preparing a solidified waste containing a monolithic solid containing a hydraulic cement, a filler having chemical and/or radioactive toxic waste contaminants, and a super-plasticizer (Col. 2, lines 50-55). The super-plasticizer allows the slurry to be easily compacted (Col. 3, lines 16-19). The radioactive waste-containing solid filler particles exhibit decreased migration in the solidified waste and the chemical waste-containing filler particles exhibit acceptable leachability (Col. 4, lines 60-65).

A claim is anticipated only if each and every element as set forth in the claim is disclosed either expressly or inherently, in a single prior art reference. See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q. 81 (Fed. Cir. 1986). The method of the present invention prevents the emission of alpha particle radiation from radioactive material. Alpha particle radiation is released from specific compounds or elements, and consists of the release of alpha particles which are two neutrons and two protons ejected from the nucleus of an atom. Applicants' invention prevents alpha particle radiation by encapsulating the radioactive material within a polymer. The polymer acts as a barrier since the alpha particles are unable to pass through the polymer. Although *Allen* teaches a method for disposing hazardous waste, it does not disclose a method of preventing the emission of radiation as claimed in the present invention. Specifically, *Allen* fails to teach or suggest a method to prevent the emission of alpha particle radiation. Furthermore, *Allen* does not teach the prevention of such radiation through the use of a polymer barrier surrounding radioactive material. Instead, *Allen* teaches the use of cement and a super-plasticizer to form a solidified mass when combined with the hazardous waste. By solidifying the radioactive waste, migration of the waste is inhibited. Thus, in contrast to the present invention, *Allen* discloses a method for the disposal of hazardous waste by immobilizing the waste, not through the use of a barrier to prevent the emission of radiation. Accordingly, *Allen* fails to anticipate the claimed invention.

For at least the reasons given above, Applicants respectfully submit that independent Claims 1 and 22 are patentable over *Allen* and request withdrawal of the rejections under 35 U.S.C. §102(b). Since Claims 2-11 and 23-29 depend from Claims 1 and 22 respectively, and recite additional claim features, Applicants submit that Claims 2-11 and 23-29 are patentable over *Allen*.

Independent Claim 12 describes a method of reducing alpha particle radiation from emitting from radioactive material-containing waste material, including forming the waste material into a geometric shape having a volume per unit surface area wherein the alpha particle radiation has less surface area from which to leave the waste material, thereby reducing the emission of alpha particle radiation from the waste material.

The *Allen* patent states that the processing, handling, chemical resistance, and overall performance of solidified waste prepared by the method disclosed in *Allen* can be further improved by the control of aggregate gradation and shape (round, angular, elongated, etc.). Col. 3, lines 63-67. As previously mentioned, unlike the present invention, *Allen* fails to disclose or suggest a method for the reduction of alpha particle radiation. In addition, *Allen* does not disclose forming radioactive waste material into a geometric shape in order to decrease the surface area of the waste material, thereby reducing the emission of alpha particle radiation from the waste material. *Allen* simply states that the processing, handling, chemical resistance, and overall performance of the solidified waste may be improved by the control of shape. There is no suggestion to form the solidified waste into a shape having a specific volume per unit surface area which will effect the amount of radiation being emitted from the waste.

Accordingly, Applicants respectfully submit that independent Claim 12 is patentable over *Allen* and request withdrawal of this rejection under 35 U.S.C. §102(b). Since Claims 13-21 depend from Claim 12 and recite additional claim features, Applicants submit that Claims 13-21 are patentable over *Allen*.

CONCLUSION

In view of the above, Applicants respectfully assert that the rejections under 35 U.S.C. §112 and 35 U.S.C. §102(b) have been overcome. Applicants further assert that the claim amendments have placed all claims in condition for allowance and request that a timely Notice of Allowance be issued. If issues may be resolved through an Examiner's Amendment, or clarified in any manner, a call to the undersigned attorney at (404) 949-2440 is respectfully requested.

AUTHORIZATIONS

The Assistant Commissioner is hereby authorized to charge any additional fees which may be required for this response, including all fees pursuant to 37. C.F.R. §1.17 for its timely consideration, or credit any overpayment to Deposit Account No. 11-0855.

Respectfully submitted,

A handwritten signature in cursive script, reading "Shelby B. Grier".

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Version With Markings to Show Changes Made

In the Specification

Please delete the 3rd full paragraph on page 4 of the specification and replace it with the following paragraph:

Accordingly it is an object of the present invention [is] to provide methods useful for treating waste material containing radioactive wastes.

In the Claims

Please re-write claims 9, 10, 12, 14, 18, 22 and 28 as follows:

9. (Amended once) The method of Claim 6, further wherein the admixture of the shielding material and the polymer/waste material admixture is formed into a geometric shape having a [high] volume per unit surface area wherein the alpha particle radiation has less surface area through which to leave the admixture.

10. (Amended once) The method of Claim 9, wherein the geometric shape is selected from a [substantially] spherical shape or a [substantially] cubic shape.

12. (Amended once) A method of reducing alpha particle radiation from emitting from radioactive material-containing waste material comprising:

forming the waste material into a geometric shape having a [high] volume per unit surface area, wherein the waste material has a smaller surface area thereby reducing the emission of alpha particle radiation from the waste material.

14. (Amended Once) The method of Claim 12, wherein the geometric shape is selected from a [substantially] spherical shape or a [substantially] cubic shape.

18. (Amended Once) The method of Claim [12] 15, wherein, subsequent to the admixing of the shielding material, a polymer material is admixed with the waste material to encapsulate the radioactive material within the polymer wherein the polymer prevents alpha particle radiation from passing through the polymer.

22. (Amended Once) A method for preventing alpha particle radiation from being emitted from radioactive material-containing waste material into an environment comprising:

admixing a polymer with the waste material to form a first admixture, wherein the polymer encapsulates the radioactive material and prevents alpha particle radiation from passing through the polymer;

admixing the first admixture with a shielding material to form a second admixture, wherein the first admixture is incorporated within the second admixture; and

forming the second admixture into a geometric shape having a [high] volume per unit surface area wherein the alpha particle radiation has less surface area through which to leave the second admixture.

28. (Amended Once) The method of Claim 22, wherein the geometric shape is selected from a [substantially] spherical shape or a [substantially] cubic shape.